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PATENT APPLICATION

ATTORNEY DOCKET NO. 10010715-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Jeffery Davis et al.

Serial No.: 09/931,987 **Examiner:** Chanh Duy Nguyen

Filing Date: August 17, 2001 **Group Art Unit:** 2675

Title: ONE CHIP USB OPTICAL MOUSE SENSOR SOLUTION

ASSISTANT COMMISSIONER FOR PATENTS
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith in triplicate is the Appeal Brief in this application with respect to the Notice of Appeal filed on May 10, 2004 and the Communication re: Appeal dated September 29, 2004. Attached are three copies of the Appeal Brief filed on July 9, 2004.

* Authorization to charge the Appeal Brief filing fee to Deposit Account 50-1078 was provided in the Appeal Brief Transmittal filed July 9, 2004.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)(1)-(5)) for

( )	one month	$110.00
( )	two months	$430.00
( )	three months	$980.00
( )	four months	$1530.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

* Please charge to Deposit Account 50-1078 the sum of _____ _____ At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 50-1078 pursuant to 37 CFR 1.25.

(X) A duplicate copy of this transmittal letter is enclosed.

(X) I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 222313-1450.
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( ) I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.
Date of Facsimile:

Typed Name: **Jeff A. Holmen**

Signature: Jeff A. Holmen

Respectfully submitted,

Jeffery Davis et al.

By Jeff A. Holmen

Jeff A. Holmen

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	Jeffery Davis et al.	Examiner:	Chanh Duy Nguyen
Serial No.:	09/931,987	Group Art Unit:	2675
Filed:	August 17, 2001	Docket No.:	10010715-1 (A310.112.101)
Due Date:	**July 10, 2004**		
Title:	ONE CHIP USB OPTICAL MOUSE SENSOR SOLUTION		

APPEAL BRIEF TO THE BOARD OF PATENT APPEALS AND INTERFERENCES OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Dear Sir or Madam:

APPELLANTS' BRIEF ON APPEAL

This Brief is presented in support of the Notice of Appeal filed on May 10, 2004, from the Final Office Action mailed February 10, 2004 and the subsequent Advisory Action dated April 19, 2004 rejecting claims 1-22 of the above-identified application. Twenty-two claims remain for consideration.

The Appeal Brief is filed in triplicate. The U.S. Patent and Trademark Office is hereby authorized to charge Deposit Account No. 50-1078 in the amount of $330.00 for filing a Brief in Support of an Appeal as set forth under 37 C.F.R. 1.17(c), however, at any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account No. 50-1078 pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account No. 50-1078 under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21. Appellants respectfully request reversal of the Examiner's rejection of pending claims 1-22.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The present application has been assigned to Agilent Technologies, Inc., a Delaware corporation, doing business at 395 Page Mill Road, Palo Alto, California 94306.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, which will have a bearing on the Board's decision in the present appeal.

STATUS OF THE CLAIMS

Claims 1-22 are pending in the application. (See Appendix A). Claims 1-22 were rejected and the rejection made final in the Office Action dated February 10, 2004, and the subsequent Advisory Action mailed April 19, 2004, and are the subject of the present Appeal.

In the final Office Action, the Examiner rejected claims 1-5, 8-13, 15-19, 21, and 22 under 35 U.S.C. §103(a) as being unpatentable over Williams et al., U.S. Patent No. 4,751,505 ("Williams") in view of Piot et al., U.S. Patent No. 6,256,016 ("Piot"). Claims 6, 7, 14, and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Williams in view of Piot, and further in view of Siddiqui, U.S. Patent No. 5,912,661 ("Siddiqui").

Claims 1-22 are appealed herein.

STATUS OF AMENDMENTS

As understood by the Appellants, no amendments to the claims have been entered subsequent to the final Office Action mailed February 10, 2004. The claims listed in Appendix A reflect the claims as of February 10, 2004. A Response After Final was filed on March 29, 2004, but no amendments to the claims were proposed by Appellants, or entered by the Examiner.

SUMMARY OF THE INVENTION

The present invention, as claimed in independent claim 1, provides an apparatus for controlling the position of a screen pointer for an electronic device having a display screen. The apparatus includes a light source for illuminating an imaging surface, thereby generating reflected images. The apparatus includes a single chip for receiving the reflected images, and

generating a first set of movement data based on the digital representations of the reflected images. The first set of movement data is indicative of relative motion between the chip and the imaging surface. The single chip includes a serial interface for outputting motion data in a serial format based on the movement data. (See, e.g., specification at page 4, line 24 to page 5, line 11; page 6, line 12 to page 7, line 14; page 9, line 14 to page 12, line 7; page 14, lines 21-29; and Figures 1-5, reference numbers 10, 16, and 34).

In another embodiment, the present invention, as claimed in independent claim 10, provides a method of controlling the position of a screen pointer for an electronic device having a display screen. The method includes illuminating an imaging surface, thereby generating reflected images. The method includes directing the reflected images onto an electronic chip, the electronic chip including an array of photo detectors. The method includes digitizing output values of the photo detectors with the electronic chip, thereby generating digital representations of the reflected images. The method includes correlating at least one version of a first one of the digital representations with at least one version of a second one of the digital representations using circuitry on the electronic chip. The method includes generating with the electronic chip a first set of motion data based on the correlation, the first set of motion data indicative of relative motion in orthogonal axes between the electronic chip and the imaging surface. The method includes outputting movement data in a serial format from the electronic chip based on the generated motion data. The method includes adjusting the position of the screen pointer in accordance with the movement data. (See, e.g., specification at page 4, line 24 to page 5, line 11; page 6, line 12 to page 7, line 14; page 9, line 14 to page 12, line 7; page 14, lines 21-29; and Figures 1-5, reference numbers 10, 16, and 34).

In another embodiment, the present invention, as claimed in independent claim 16, provides an electronic chip for use in an apparatus for controlling the position of a screen pointer. The electronic chip includes an array of photo detectors for receiving reflected light from an imaging surface. The electronic chip includes an analog to digital converter coupled to the array of photo detectors for generating digital image data based on outputs of the photo detectors. The electronic chip includes a controller coupled to the analog to digital converter. The controller is configured to generate a first set of movement data based on the digital image data. The first set of movement data is indicative of relative motion between the

electronic chip and the imaging surface. The electronic chip includes a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format. (See, e.g., specification at page 4, line 24 to page 5, line 11; page 6, line 12 to page 7, line 14; page 9, line 14 to page 12, line 7; page 14, lines 21-29; and Figures 1-5, reference numbers 10, 16, and 34).

ISSUES PRESENTED FOR REVIEW

I. Whether the rejection of claims 1-5, 8-13, 15-19, 21, and 22 in the Final Office Action mailed February 10, 2004 under 35 U.S.C. §103(a) as being unpatentable over Williams et al., U.S. Patent No. 4,751,505 ("Williams") in view of Piot et al., U.S. Patent No. 6,256,016 ("Piot"), sets forth a case of *prima facie* obviousness.

II. Whether the rejection of claims 6, 7, 14, and 20 in the final Office Action mailed February 10, 2004 under 35 U.S.C. §103(a) as being unpatentable over Williams in view of Piot, and further in view of Siddiqui, U.S. Patent No. 5,912,661 ("Siddiqui"), sets forth a case of *prima facie* obviousness.

GROUPING OF THE CLAIMS

The claims do not stand or fall together, but are grouped as follows and each group is believed to be separately patentable.

I. Claims 1-3

II. Claim 4

III. Claim 5

IV. Claim 6

V. Claim 7

VI. Claim 8

VII. Claim 9

VIII. Claims 10-12

IX. Claim 13

X. Claim 14

XI. Claim 15

XII. Claims 16-18, and 21

XIII. Claim 19

XIV. Claim 20

XV. Claim 22

ARGUMENT

Rejections Under 35 U.S.C. §103

A. The Applicable Law

The Examiner has the burden under 35 U.S.C. §103 to establish a *prima facie* case of obviousness. *In re Fine,* 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Three criteria must be satisfied to establish a *prima facie* case of obviousness. First, the Examiner must show that some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art would teach, suggest, or motivate one to modify a reference or to combine the teachings of multiple references. *Id.* Second, the prior art can be modified or combined only so long as there is a reasonable expectation of success. *In re Merck & Co., Inc.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Third, the prior art reference or combined prior art references must teach or suggest all of the claim limitations. *In re Royka,* 490 F.2d 981, 180 USPQ 580 (CCPA 1974). These three criteria are also set forth in §706.02(j) of the M.P.E.P.

Even when obviousness is based on a single reference, there must be a showing of suggestion or motivation to modify the teachings of that reference. *In re Kotzab,* 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). In performing the obviousness inquiry under 35 U.S.C. §103, the Examiner must avoid hindsight. *In re Bond,* 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied,* 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990).

B. Rejection of Claims 1-5, 8-13, 15-19, 21, and 22 based on Williams and Piot

The rejection of claims 1-5, 8-13, 15-19, 21, and 22 in the Final Office Action mailed February 10, 2004, under 35 U.S.C. §103(a) as being unpatentable over Williams and Piot, is not correct and should be withdrawn, because the rejection fails to establish a case of *prima facie* obviousness.

Independent claim 1 includes the limitation "a single chip for receiving the reflected images, generating digital representations of the reflected images, generating a first set of movement data based on the digital representations of the reflected images, the first set of movement data indicative of relative motion between the chip and the imaging surface, the single chip including a serial interface for outputting motion data in a serial format based on the movement data." The Examiner stated that "[t]he only thing Williams does not show is a serial interface included in the single chip." (Final Office Action at para. no. 4, page 3). The Examiner also stated that:

> In the same field of endeavor, Piot teaches that the microcontroller (650) is also coupled to the line interface 660 . . . the output from the line interface 660 is a standard communication, such as a serial port communication protocol; see column 13, lines 41-54. Piot also teaches that microcontroller (650) can be integrated by different modules such 620, 625 (see column 13, lines 45-54). Thus it would have been obvious that the microcontroller (650) can be integrated with the serial interface protocol (660) so as to reduce the size of the input device. Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to have added a serial interface as taught by Piot to the integrated circuit of Williams so that the size of the input device can be reduced. (Final Office Action at para. no. 4, page 3).

The Federal Circuit has stated, "[i]n holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention." *Karsten Manufacturing Corp. v. Cleveland Golf Co.*, 58 U.S.P.Q.2d 1286, 1293 (CAFC 2001). There is no suggestion in Williams or Piot to combine the cited references in any way, let alone in a way that would produce the claimed invention. Williams and Piot disclose different types of devices that rely on different processing techniques. The optical mouse disclosed in Williams requires that it be used in conjunction with a special patterned mouse pad. (See, e.g., Williams at col. 2, lines 3-5; and col. 2, lines 59-61). In contrast, the optical detection system disclosed in Piot generates speckle images from a scattered collimated beam, and Piot indicates that "[t]he system works with any surface that can diffusely scatter a collimated beam." (See, e.g., Piot at Abstract).

Furthermore, Williams includes no teaching or suggestion that the optical mouse disclosed therein could or should be modified to include a serial interface anywhere within

the mouse, let alone that a serial interface could or should be incorporated into the integrated circuit 124. Piot includes no teaching or suggestion that the line interface 660 could or should be incorporated into the same integrated circuit as microcontroller 650 and/or other circuitry, such as the photosensor arrays 320, or cross-correlation modules 620 and 625. Rather, Piot discloses that:

> "It is noted that the photosensor arrays 320, microcontroller 650, and cross-correlation modules 620, 625 may be integrated on a single complementary metal oxide semiconductor integrated circuit using a conventional digital signal processing ("DSP") core. In an alternative embodiment, these elements may be built using discrete integrated circuits such as a microcontroller or DSP chips, for example." (Piot at Col. 13, lines 46-53).

Piot includes no teaching or suggestion that the line interface 660 might also be incorporated into this single CMOS integrated circuit. Even if Williams and Piot were combined, which there is no suggestion to do, and the line interface 660 of Piot were incorporated into the optical mouse disclosed in Williams, as suggested by the Examiner, the teachings of Piot indicate that the line interface 660 would not be incorporated into a common integrated circuit with other elements of the mouse. Thus, the combination of Williams and Piot does not teach or suggest each and every limitation of claim 1.

The Examiner made the following statements in the Final Office Action:

> On page 7, first paragraph, Applicant argues that there is no suggestion to combine the references, the Examiner recognizes the obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, **both William and Piot teach an optical mouse**. Although William's processing techniques may differs (sic) from Piot's device, but **both Williams and Piot provide an optical detection system that detects movement of an optical pointing device relative to a surface**. (Final Office Action at para. no. 6, page 5) (emphasis added).

Saying that both Williams and Piot provide an optical detection system that detects movement of an optical pointing device relative to a surface is essentially repeating the statement that both Williams and Piot teach an optical mouse. An optical mouse detects movement of the mouse relative to a surface. However, the argument that both Williams and

Piot disclose an optical mouse does not establish a *prima facie* case of obviousness, as there must also be a suggestion to combine these references in a manner that would produce the claimed invention. As described above, there is no such suggestion, and even if the references are combined, the combination does not teach or suggest each and every limitation of the claims.

The Examiner also made the following statements in the Final Office Action:

> On page 7, second paragraph, Applicant argues that Williams includes no teaching or suggestion that the optical mouse disclosed therein could or should be modified to include a serial interface anywhere within the mouse. However, **Applicant simply argues the reference of Williams, but the rejection is over Williams in view of Piot. Thus, while Williams does not mention a serial interface, but Piot clearly teaches a serial interface included in the mouse.** Applicant also argues that Piot includes not (sic) teaching or suggestion that the line interface 660 could or should be cooperated (sic) into the same integrated circuit as microcontroller. **However, Piot also teaches that microcontroller (650) can be integrated by different modules such 620, 625 (see column 13, lines 45-54). Piot also teaches that microcontroller (650) can be integrated by different modules such 620, 625 (see column 13, lines 45-54).** Thus it would have been obvious that the microcontroller (650) can be integrated with the serial interface protocol (660) so as to reduce the size of the input device. (Final Office Action at para. no. 6, page 6) (emphasis added).

Applicant respectfully disagrees with the statement that "Applicant simply argues the reference of Williams . . . ." Applicant addressed both references in detail in the Response filed on November 17, 2003, and indicated how neither reference provides a teaching or suggestion to make the combination proposed by the Examiner. The Examiner stated "[t]hus, while Williams does not mention a serial interface, but Piot clearly teaches a serial interface included in the mouse." Simply arguing that Piot's mouse includes a serial interface does not establish that there is some teaching or suggestion to modify Williams to include a serial interface. There is no teaching or suggestion in Williams that the optical mouse disclosed therein could or should be modified to include a serial interface anywhere within the mouse, let alone that a serial interface could or should be incorporated into the integrated circuit 124. There is no teaching or suggestion in Piot that the line interface 660 disclosed therein could or should be used in place of an output system that outputs x and y pulse train outputs with the direction and speed of the motion contained in the phase shift and frequency of the output signals, such as the output system disclosed in Williams. There is also no teaching or

suggestion in Piot that the line interface 660 disclosed there could or should be incorporated into any integrated circuit, let alone an integrated circuit like that disclosed in Williams.

As shown in the above block quote, the Examiner makes the statement (twice) that "Piot also teaches that microcontroller (650) can be integrated by different modules such 620, 625 (see column 13, lines 45-54)." Applicant respectfully disagrees with this statement. Piot does not disclose that microcontroller 650 can be integrated by "different modules," and Piot does not disclose that microcontroller 650 can be integrated by different modules "such [as]" 620, 625. Rather, the portion of Piot cited by the Examiner discloses the following:

> It is noted that the photosensor arrays 320, microcontroller 650, and cross-correlation modules 620, 625 may be integrated on a single complementary metal oxide semiconductor integrated circuit using a conventional digital signal processing ("DSP") core. In an alternative embodiment, **these elements** may be built using discrete integrated circuits such as a microcontroller or DSP chips, for example. (emphasis added).

Thus, Piot discloses that elements 320, 620, 625, and 650 may be integrated on a single integrated circuit, or "these elements" may be built using discrete integrated circuits. Piot includes no teaching or suggestion regarding integrating line interface 660 with microcontroller 650 as proposed by the Examiner, or with any other element.

In response to the Applicant's arguments, the Examiner also made the following statements in the Final Office Action:

> Moreover, the use of a one piece construction instead of the structure disclosed in Williams and Piot would be merely a matter of obvious engineering choice. *In re Larson*, 144 USPQ 347 (CCPA 1965); *In re Fridolph*, 50 CCPA 745 89 F.2d 509, 135 USPQ 319. The unification or integration involve more than mere depending more upon the choice of the manufacturer, and the convenience and availability of the machine and tools necessary to construct the device. *In re Lockhart*, 90 USPQ 214 (CCPA 1951); *In re Murray*, 19 CCPA (Patents) 739, 53 F.2d 541, 11 USPQ 155; *In re Zabel et al.*; CCPA (Patents) 832, 186 F.2d 735, 88 USPQ 367. (Final Office Action at para. no. 6, page 6).

The MPEP specifies that "[i]f the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court. If the applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on case law as the rationale to support an obviousness rejection." MPEP § 2144 (emphasis in original). The facts of the cases cited by the Examiner are quite

different from the facts of the present case. In addition, it is inappropriate to rely solely on such cases as the rationale to support the Examiner's obviousness rejection. Since there is no suggestion to combine the cited references, and even if combined, the references do not teach or suggest each and every limitation of the claims, it would be inappropriate to rely solely on the cited cases to support the Examiner's rejection.

In addition to not including any teaching or suggestion regarding a serial interface, which has been acknowledged by the Examiner, Williams also does not teach or suggest that the integrated circuit 124 generates digital representations of reflected images as recited in claim 1. Similarly, Piot indicates that the data signals from photosensor arrays 320a and 320b can be converted into digital values, but does not teach or suggest incorporating an analog-to-digital converter into an integrated circuit, such as the integrated circuit disclosed in Williams.

In view of the above, independent claim 1 is not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claim 1.

Dependent claims 2-5, 8, and 9, further limit patentably distinct claim 1, and are believed to be allowable over the cited references. In addition, dependent claims 4-5, 8, and 9, are further distinguishable over the cited references. Claim 4 includes the limitation "wherein the single chip is configured to receive button press information identifying a button that has been pressed on the apparatus." Claim 5 is dependent on claim 4 and includes the limitation "wherein the single chip is configured to output the button press information in a serial format through the serial interface." With respect to claims 4 and 5, the Examiner stated that "Williams clearly teaches the button (116, 114) connected to the integrated circuit (124). Thus, combining Williams and Piot would met (sic) the cliaemd (sic) limitation." (Final Office Action at para. no. 4, page 4). Figure 3 of Williams appears to show that both the microswitch 114 and the integrated circuit 124 are connected to the printed wiring board 118. However, there is no teaching or suggestion in Williams that the microswitch 114 and the integrated circuit 124 are electrically connected together, such as through traces in the printed wiring board 118. There is no teaching or suggestion in Williams that the integrated circuit 124 is configured to receive button press information as recited in claim 4, or output button press information as recited in claim 5. Piot also includes no teaching or suggestion

regarding a chip that receives button press information as recited in claim 4, or outputs button press information as recited in claim 5. Thus, Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claims 4 and 5.

Claim 8 includes the limitation "wherein the serial interface is configured to be coupled to a host device, and wherein the single chip is configured to provide testing information about the chip to the host device through the serial interface." Claim 9 includes the limitation "wherein the single chip is configured to receive orientation information indicating a mounting orientation of the single chip." The Examiner stated that "[a]s to claims 8-9 and 22, since the microcontroller of Piot can be programmable. Thus, the microcontroller of Piot can provide test information as recited in claim 8 and configure (sic) to receive orientation information indicating a mounting orientation of the chip as recited in claim 9." (Final Office Action at para. no. 4, page 4). There is no teaching or suggestion in Piot that the microcontroller is programmed, or could or should be programmed, to provide testing information, or receive orientation information. The Examiner has not provided any specific citation in either Williams or Piot that teaches or suggests a chip that is configured to provide testing information as recited in claim 8, or receive orientation information as recited in claim 9. Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claims 8 and 9.

In view of the above, dependent claims 2-5, 8, and 9 are not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claims 2-5, 8, and 9.

Independent claim 10 includes the limitation "outputting movement data in a serial format from the electronic chip based on the generated motion data". The Examiner stated that "[a]s to claim 10, this claim differs from claim 1 in that claim 1 is apparatus whereas claim 10 is method. Thus, method claim 10 is met by Williams in view of Piot." (Final Office Action at para. no. 4, pages 3-4). As described above with respect to claim 1, there is no suggestion in the cited references to combine Williams and Piot, and even if the references are combined, they do not teach or suggest the limitations of claim 1. For the reasons set forth above with respect to claim 1, the combination of Williams and Piot also does not teach or suggest the limitations of claim 10, including the limitations "digitizing output values of

the photo detectors with the electronic chip" and "outputting movement data in a serial format from the electronic chip based on the generated motion data".

In view of the above, independent claim 10 is not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claim 10.

Dependent claims 11-13, and 15 further limit patentably distinct claim 10, and are believed to be allowable over the cited references. In addition, dependent claims 13 and 15 are further distinguishable over the cited references. Claim 13 includes the limitation "receiving button press information with the electronic chip, the button press information identifying a button coupled to the electronic chip that has been pressed; and outputting the button press information from the electronic chip in a serial format." As described above with respect to claims 4 and 5, Williams and Piot include no teaching or suggestion regarding a chip that receives button press information, or outputs button press information. In view of the above, Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claim 13.

Dependent claim 15 includes the limitation "outputting test information from the electronic chip in a serial format, the test information including results of internal tests performed by the electronic chip." As described above with respect to claim 8, Williams and Piot include no teaching or suggestion regarding a chip that is configured to provide testing information. In view of the above, Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claim 15.

In view of the above, dependent claims 11-13, and 15 are not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claims 11-13, and 15.

Independent claim 16 is directed to an electronic chip that includes "a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format." The Examiner stated that "[a]s to claim 16, this claim differs from claim 1 in that the limitation an alog (sic) to digital converter is additional (sic) recited." (Final Office Action at para. no. 4, page 4). As described above with respect to claim 1, there is no suggestion in the cited references to combine Williams and Piot, and even if the references are combined, they do not teach or suggest the limitations of claim 1. For the reasons set

forth above with respect to claim 1, the combination of Williams and Piot also does not teach or suggest the limitations of claim 16, including the limitations "an analog to digital converter coupled to the array of photo detectors for generating digital image data based on outputs of the photo detectors" and "a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format."

In view of the above, independent claim 16 is not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claim 16.

Dependent claims 17-19, 21, and 22, further limit patentably distinct claim 16, and are believed to be allowable over the cited references. In addition, dependent claims 19 and 22 are further distinguishable over the cited references. Claim 19 includes the limitation "wherein the electronic chip is configured to receive button press information identifying a button that has been pressed on the apparatus, and wherein the electronic chip is configured to output the button press information in a serial format through the serial interface." As described above with respect to claims 4 and 5, Williams and Piot include no teaching or suggestion regarding a chip that receives button press information, or outputs button press information. In view of the above, Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claim 19.

Claim 22 includes the limitation "wherein the first set of movement data generated by the controller is also based on orientation information indicating a mounting orientation of the electronic chip within the apparatus." As described above with respect to claim 9, Williams and Piot include no teaching or suggestion regarding a chip that is configured to receive orientation information. Williams and Piot also do not teach or suggest generating movement data based on orientation information as recited in claim 22. In view of the above, Williams and Piot, either alone or in combination, do not teach or suggest the limitations of claim 22.

In view of the above, dependent claims 17-19, 21, and 22 are not taught or suggested by Williams and Piot, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claims 17-19, 21, and 22.

In summary, the rejection of Appellants' claims 1-5, 8-13, 15-19, 21, and 22, based on Williams and Piot, for the above-cited reasons, fails to set forth a *prima facie* case of obviousness and should be withdrawn.

C. Rejection of Claims 6, 7, 14, and 20 based on Williams, Piot, and Siddiqui

The rejection of claims 6, 7, 14, and 20 in the Final Office Action mailed February 10, 2004, under 35 U.S.C. §103(a) as being unpatentable over Williams, Piot, and Siddiqui, is not correct and should be withdrawn, because the rejection fails to establish a case of *prima facie* obviousness.

Claims 6, 7, 14, and 20 are each dependent on independent claim 1, 10, or 16. As described above, Williams and Piot do not teach or suggest the above-quoted limitations of claims 1, 10, and 16. Siddiqui also does not teach or suggest the above-quoted limitations of claim 1, 10, and 16, nor is there any suggestion to combine the cited references. In view of the above, dependent claims 6, 7, 14, and 20, which further limit patentably distinct claim 1, 10, or 16, are believed to be allowable over the cited references, either alone, or in combination.

In addition, claims 6, 7, 14, and 20 are further distinguishable over the cited references. Claim 6 includes the limitation "wherein the single chip is configured to receive Z wheel information indicative of movement of a Z wheel on the apparatus." Claim 7 is dependent on claim 6 and includes the limitation "wherein the single chip is configured to output the Z wheel information in a serial format through the serial interface." Claim 14 includes the limitation "receiving Z wheel information with the electronic chip, the Z wheel information indicative of movement of a Z wheel coupled to the electronic chip; and outputting the Z wheel information from the electronic chip in a serial format." Claim 20 includes the limitation "wherein the electronic chip is configured to receive Z wheel information indicative of movement of a Z wheel on the apparatus, and wherein the electronic chip is configured to output the Z wheel information in a serial format through the serial interface."

The Examiner acknowledged that William and Piot do not teach or suggest the limitations of claims 6, 7, 14, and 20, but stated that "it would have been obvious to one of ordinary skill in the art at the [time the] invention was made to have added the z wheel button

as taught by Siddiqui to the input devic eof (sic) William as modified by Piot . . . ." (Final Office Action at para. no. 5, page 5). However, claims 6, 7, 14, and 20 include limitations regarding a "chip," such as receiving Z wheel information with the chip, and outputting Z wheel information from the chip in a serial format. Even if the z-wheel of Siddiqui were added to the input device of Williams as proposed by the Examiner, which there is no suggestion to do, there is still no teaching or suggestion in the cited references that the integrated circuit 124 of Williams could or should be modified to receive Z wheel information from such an added z-wheel. There is no suggestion to make such a modification, particularly in light of the fact that there is no teaching or suggestion in Williams regarding receiving any button press information with integrated circuit 124.

In view of the above, dependent claims 6, 7, 14, and 20 are not taught or suggested by Williams, Piot, and Siddiqui, either alone, or in combination. The Examiner has not established a case of *prima facie* obviousness of claims 6, 7, 14, and 20.

In summary, the rejection of Appellants' claims 6, 7, 14, and 20, based on Williams, Piot, and Siddiqui, for the above-cited reasons, fails to set forth a *prima facie* case of obviousness and should be withdrawn.

CONCLUSION

For the above reasons, Appellants respectfully submit that the cited art neither anticipates nor renders the claimed invention obvious, and therefore the claimed invention does patentably distinguish over the cited art. Therefore, Appellants respectfully submit that the above rejections to pending claims 1-22 must be withdrawn and that these claims be allowed.

The U.S. Patent and Trademark Office is hereby authorized to charge the fee of $330.00 to Deposit Account No. 50-1078 for filing an a Appeal Brief as set forth under 37 C.F.R. 1.17(c). However, at any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 50-1078 pursuant to 37 C.F.R. 1.25. Additionally, please charge any additional fees to Deposit Account 50-1078 under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Any inquiry regarding this Amendment and Response should be directed to Jeff A. Holmen at the below-listed telephone number or Pamela Lau Kee at Telephone No. (408)

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CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 9th day of July, 2004.

By
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IN THE CLAIMS

1.(Original) An apparatus for controlling the position of a screen pointer for an electronic device having a display screen, the apparatus comprising:

a light source for illuminating an imaging surface, thereby generating reflected images;

a single chip for receiving the reflected images, generating digital representations of the reflected images, generating a first set of movement data based on the digital representations of the reflected images, the first set of movement data indicative of relative motion between the chip and the imaging surface, the single chip including a serial interface for outputting motion data in a serial format based on the movement data.

2.(Original) The apparatus of claim 1, wherein the apparatus is an optical mouse.

3.(Original) The apparatus of claim 1, wherein the serial interface is a Universal Serial Bus (USB) interface.

4.(Original) The apparatus of claim 1, wherein the single chip is configured to receive button press information identifying a button that has been pressed on the apparatus.

5.(Original) The apparatus of claim 4, wherein the single chip is configured to output the button press information in a serial format through the serial interface.

6.(Original) The apparatus of claim 1, wherein the single chip is configured to receive Z wheel information indicative of movement of a Z wheel on the apparatus.

7.(Original) The apparatus of claim 6, wherein the single chip is configured to output the Z wheel information in a serial format through the serial interface.

8.(Original) The apparatus of claim 1, wherein the serial interface is configured to be coupled to a host device, and wherein the single chip is configured to provide testing information about the chip to the host device through the serial interface.

9.(Original) The apparatus of claim 1, wherein the single chip is configured to receive orientation information indicating a mounting orientation of the single chip.

10.(Original) A method of controlling the position of a screen pointer for an electronic device having a display screen, the method comprising:

illuminating an imaging surface, thereby generating reflected images;

directing the reflected images onto an electronic chip, the electronic chip including an array of photo detectors;

digitizing output values of the photo detectors with the electronic chip, thereby generating digital representations of the reflected images;

correlating at least one version of a first one of the digital representations with at least one version of a second one of the digital representations using circuitry on the electronic chip;

generating with the electronic chip a first set of motion data based on the correlation, the first set of motion data indicative of relative motion in orthogonal axes between the electronic chip and the imaging surface;

outputting movement data in a serial format from the electronic chip based on the generated motion data; and

adjusting the position of the screen pointer in accordance with the movement data.

11.(Original) The method of claim 10, wherein the electronic chip is incorporated in an optical mouse.

12.(Original) The method of claim 10, wherein the serial format is a Universal Serial Bus (USB) format.

13.(Original) The method of claim 10, and further comprising:

receiving button press information with the electronic chip, the button press information identifying a button coupled to the electronic chip that has been pressed; and

outputting the button press information from the electronic chip in a serial format.

14.(Original) The method of claim 10, and further comprising:

receiving Z wheel information with the electronic chip, the Z wheel information indicative of movement of a Z wheel coupled to the electronic chip; and

outputting the Z wheel information from the electronic chip in a serial format.

15.(Original) The method of claim 10, and further comprising:

outputting test information from the electronic chip in a serial format, the test information including results of internal tests performed by the electronic chip.

16.(Original) An electronic chip for use in an apparatus for controlling the position of a screen pointer, the electronic chip comprising:

an array of photo detectors for receiving reflected light from an imaging surface;

an analog to digital converter coupled to the array of photo detectors for generating digital image data based on outputs of the photo detectors;

a controller coupled to the analog to digital converter, the controller configured to generate a first set of movement data based on the digital image data, the first set of movement data indicative of relative motion between the electronic chip and the imaging surface; and

a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format.

17.(Original) The electronic chip of claim 16, wherein the apparatus is an optical mouse.

18.(Original) The electronic chip of claim 16, wherein the serial interface is a Universal Serial Bus (USB) interface.

19.(Original) The electronic chip of claim 16, wherein the electronic chip is configured to receive button press information identifying a button that has been pressed on the apparatus, and wherein the electronic chip is configured to output the button press information in a serial format through the serial interface.

20.(Original) The electronic chip of claim 16, wherein the electronic chip is configured to receive Z wheel information indicative of movement of a Z wheel on the apparatus, and wherein the electronic chip is configured to output the Z wheel information in a serial format through the serial interface.

21.(Original) The electronic chip of claim 16, wherein the controller is a pico-processor.

22.(Original) The electronic chip of claim 16, wherein the first set of movement data generated by the controller is also based on orientation information indicating a mounting orientation of the electronic chip within the apparatus.